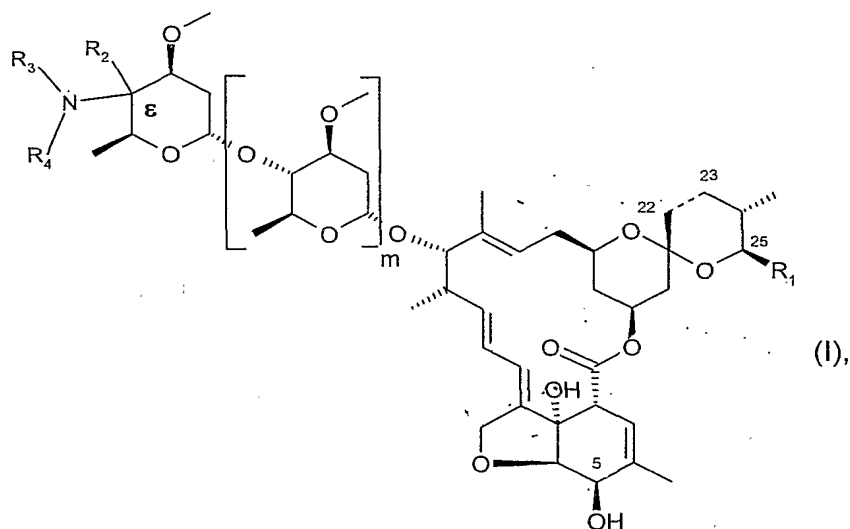


CLAIMS

1. A compound of the formula (I)



(I),

5 wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single or double bond,

m is 0 or 1,

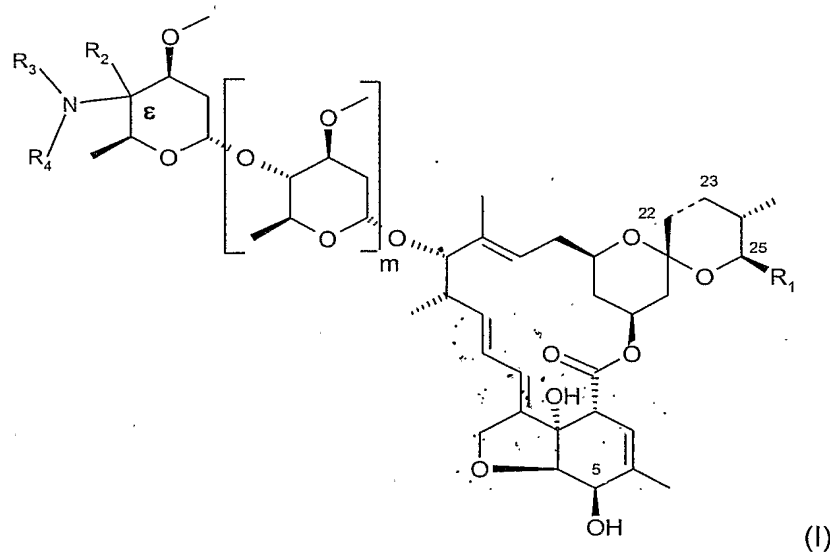
R₁ represents a C₁-C₁₂alkyl, C₃-C₈cycloalkyl or C₂-C₁₂alkenyl group,

R₂ represents a hydrocarbyl group or a substituted hydrocarbyl group, and

10 R₃ and R₄ represent, independently of each other, hydrogen or a chemical constituent, or either R₂ and R₃ together or R₃ and R₄ together represent a three- to seven-membered alkylene or a four- to seven-membered alkenylene bridge, for each of which at least one, preferably a CH₂ group may be replaced by O, S or NR₆, where R₆ represents hydrogen or a hydrocarbyl group or a substituted hydrocarbyl group; or, if appropriate, an E/Z isomer
15 and/or tautomer of the compound of formula (I), in each case in free form or in salt form.

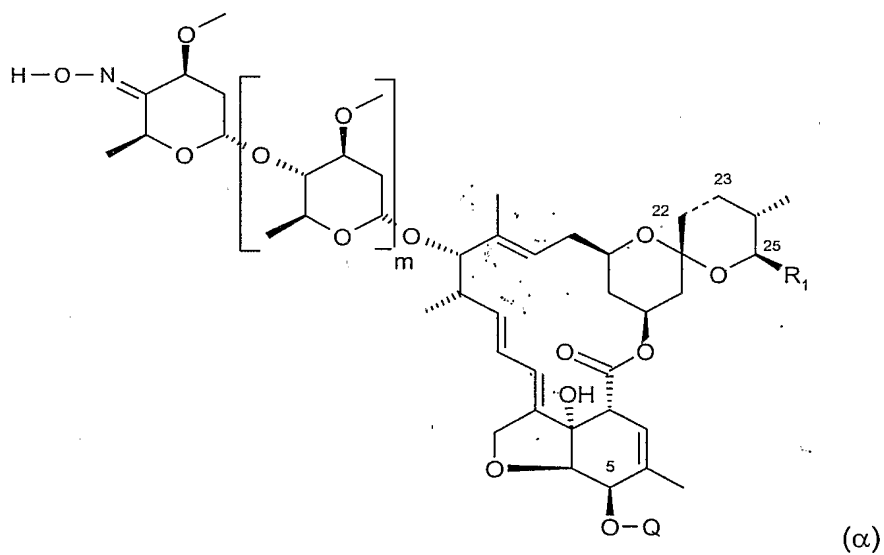
2. A process for preparing a compound of formula (I)

-163-



wherein R₁, R₂, R₃, R₄, the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, comprising the steps of:

- 5 (i) synthesizing a compound of formula (α)



wherein R₁, the bond between the carbon atoms 22 and 23 and m are as defined for formula (I) in claim 1 and Q is a protecting group;

-164-

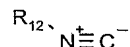
(ii) reacting a disulfide, an aliphatic or aromatic phosphine and a compound of formula (α) to yield a sulfenimine derivative of the compound of formula (α);

(iii) oxidising the sulfenimine derivative of the compound of formula (α) to yield a sulfinimine derivative of the compound of formula (α);

either

(iva) reacting an organometallic reagent having the R_2 group with the sulfinimine derivative of the compound of formula (α) to yield a desoxy - sulfinamide - hydrocarbyl derivative of the compound of formula (α); or

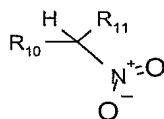
(ivb) reacting an isocyanate reagent of formula



where R_{12} is unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl, unsubstituted or mono- to pentasubstituted C_3 - C_{12} cycloalkyl, unsubstituted or mono- to pentasubstituted C_2 - C_{12} alkenyl, unsubstituted or mono- to pentasubstituted C_2 - C_{12} alkynyl, unsubstituted or mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl unsubstituted or mono- to pentasubstituted C_3 - C_{12} cycloalkyl ester, unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl ester, unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl sulfone or unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl nitrile with the sulfinimine derivative of the compound of formula (α) to yield a desoxy - amine -

hydrocarbyl derivative of the compound of formula (α); or

(ivc) reacting an nitro alkyl reagent of formula



where R_{10} and R_{11} are independently of each other, H, CN, unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl, unsubstituted or mono- to pentasubstituted C_3 - C_{12} cycloalkyl, unsubstituted or mono- to pentasubstituted C_2 - C_{12} alkenyl, unsubstituted or mono- to

-165-

pentasubstituted C₂-C₁₂alkynyl, unsubstituted or mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl, unsubstituted or mono- to pentasubstituted C₃-C₁₂cycloalkyl ester, an unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl ester, unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl sulfone or
 5 unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl nitrile with the sulfinimine derivative of the compound of formula (α) to yield a desoxy - amine - hydrocarbonyl derivative of the compound of formula (α); and

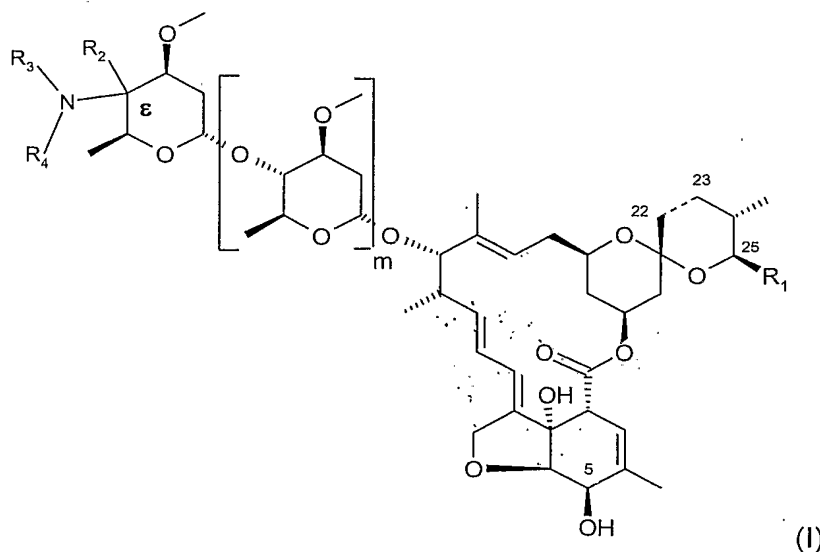
either

(va) removing the sulfinyl group and protecting group Q either in one step or sequentially
 10 one after another to yield a compound of formula (I), where R₃ and R₄ each represent hydrogen, or

(vb) removing the sulfinyl group alone, carrying out reactions on one or more of the R₂, R₃ and R₄ groups to modify the group and then removing the protecting group Q to yield a compound of formula (I), or

15 (vc) removing the protecting group Q if the sulfinyl group is removed during (iva) or (ivb) or (ivc) to yield a compound of formula (I).

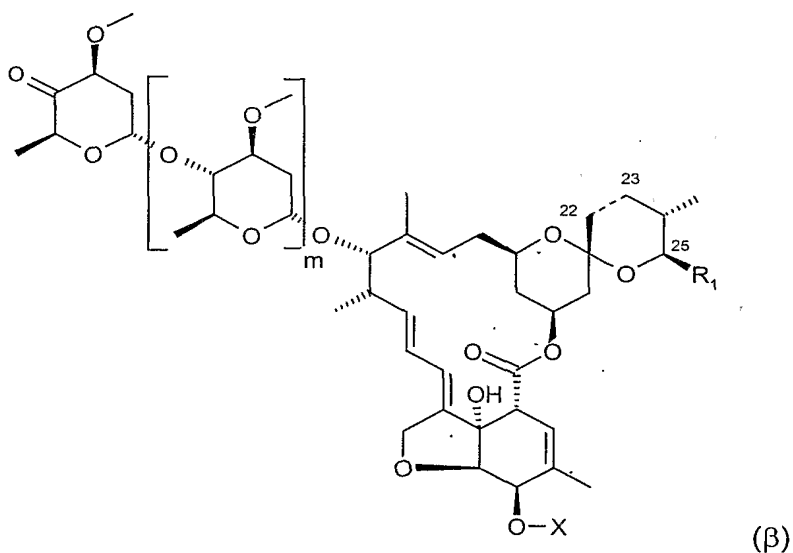
3. A process for preparing a compound of formula (I)



wherein R_1 , R_2 , R_3 , R_4 , the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, comprising the steps of:

5

(i) synthesizing a compound of formula (β)



wherein R_1 , the bond between the carbon atoms 22 and 23 and m is as defined for formula (I) in claim 1 and X is H or Q, where Q is a protecting group;

10

(ii) reacting $N-R_4$ hydroxylamine or salt thereof with a compound of formula (β) to yield a nitron derivative of the compound of formula (β);

either

15

(iia) reacting an organometallic or a silyl reagent having the R_2 group with nitron derivative of the compound of formula (β) to yield a desoxy - $N-R_4$ hydroxylamino - hydrocarbyl

-167-

derivative of the compound of formula (β), where R_4 is as defined for formula (I) in claim 1, or

(iiib) reacting an alkene or an alkyne derivative with the nitron derivative of the compound of formula (β) to yield a desoxy – N-isoxazolidine derivative or 2,3-dihydro-isoxazole

5 derivative respectively of the compound of formula (β); and

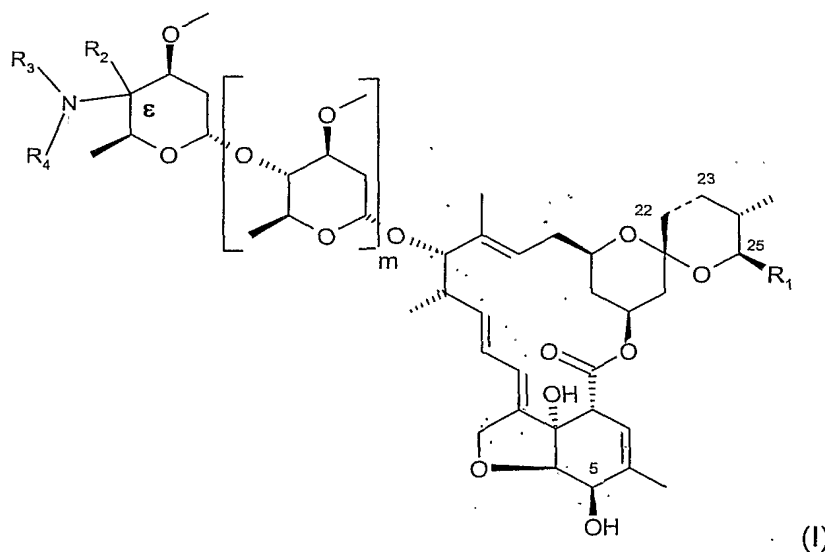
either

(iva) removing the protecting group Q, if present, to yield a compound of formula (I), where R_3 is OH in the event of reaction step (iiia), or where R_2 and R_3 is an alkylene or alkenylene

10 bridge with a CH_2 group replaced by an oxygen atom in the event of reaction step (iiib), or

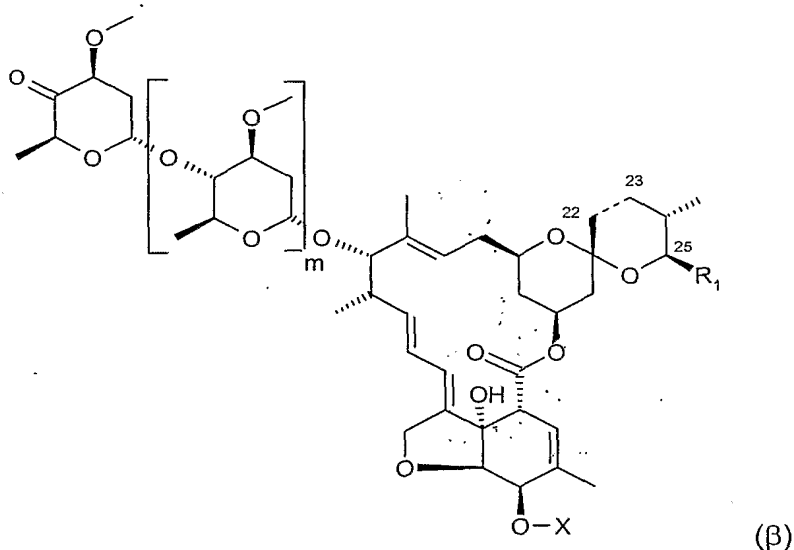
(ivb) carrying out reactions on one or more of R_2 , R_3 and R_4 groups to modify the group and removing the protecting group Q, if present, to yield a compound of formula (I).

4. A process for preparing a compound of formula (I)



15 wherein R_1 , R_3 , R_4 , the bond between the carbon atoms 22 and 23 and m are as defined in claim 1 and R_2 is CN, comprising the steps of:

(i) synthesizing a compound of formula (β)



wherein R_1 , the bond between the carbon atoms 22 and 23 and m is as defined in for
 5 formula (I) in claim 1 and X is H or Q, where Q is a protecting group;

either

(iia) reacting the compound of formula (β) with a silylated amine (having the R_3 and R_4
 groups) in presence of a Lewis acid and a trialkylsilyl cyanide, to yield a compound of
 10 formula (I) with the proviso that the oxygen atom at the 5-carbon position is protected, if Q
 is present, and wherein R_1 , R_3 , R_4 , the bond between the carbon atoms 22 and 23 and m
 are as defined in claim 1, and R_2 is CN, or

(iib) reacting the compound of formula (β) with an amine of formula R_3R_4NH , a chlorosilane,
 a Lewis acid and a trialkylsilyl cyanide to yield a compound of formula (I) with the proviso
 15 that the oxygen atom at the 5-carbon position is protected, if Q is present, and wherein R_1 ,
 R_3 , R_4 , the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, and
 R_2 is CN;

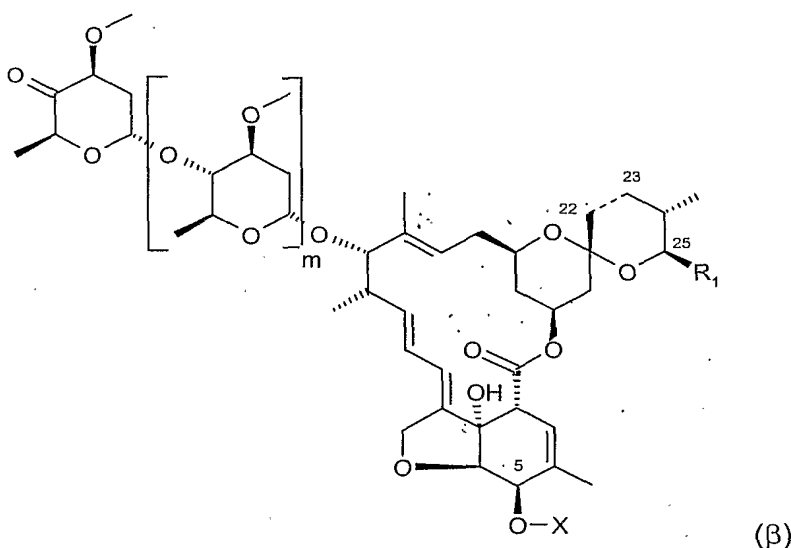
-169-

(iii) optionally carrying out reactions on one or both of R_3 and R_4 groups to modify the group; and

(iv) removing the protecting group Q, if present, to yield a compound of formula (I);

5 or

(i) synthesizing a compound of formula (β)



wherein R_1 , the bond between the carbon atoms 22 and 23 and m are as defined for formula (I) in claim 1 and X is H or Q, where Q is a protecting group;

10

(ii) reacting the compound of formula (β) with an ammonium salt of formula $R_{18}CO_2^-NH_4^+$, an isocyanide of formula $R_{12}NC$ to yield a compound of formula (I), with the proviso that the oxygen atom at the 5-carbon position is protected, if Q is present in the compound of formula (β), wherein R_1 , the bond between the carbon atoms 22 and 23 and m are as defined in claim 1, R_2 is $R_{12}NHC(O)$, and R_4 is $R_{18}C(O)$, R_{18} is H, unsubstituted or mono- to pentasubstituted C_1 - C_{12} alkyl, unsubstituted or mono- to pentasubstituted C_3 - C_{12} cycloalkyl, unsubstituted or mono- to pentasubstituted C_2 - C_{12} alkenyl, unsubstituted or mono- to pentasubstituted C_2 - C_{12} alkynyl, unsubstituted or mono- to pentasubstituted aryl, unsubstituted or mono- to pentasubstituted benzyl, unsubstituted or mono- to

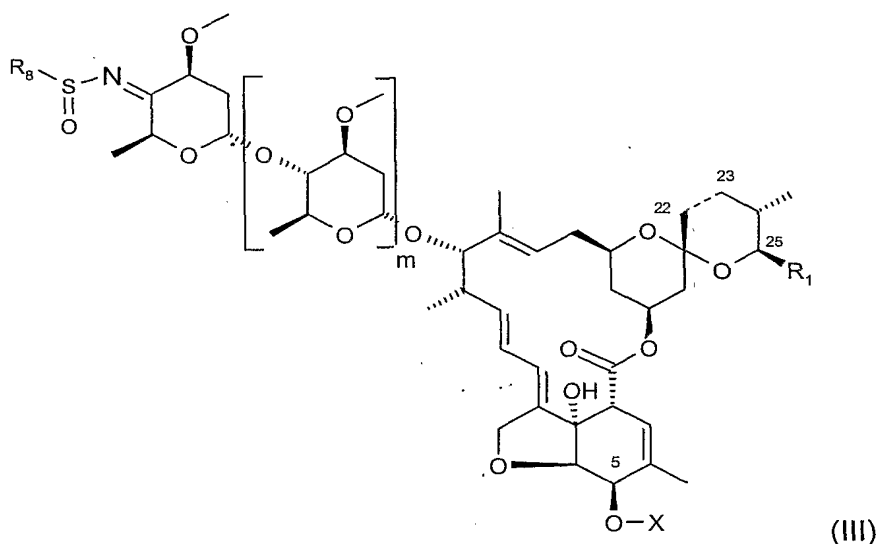
15

pentasubstituted C₃-C₁₂cycloalkyl ester, unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl ester, unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl sulfone or unsubstituted or mono- to pentasubstituted C₁-C₁₂alkyl nitrile and R₁₂ is as defined in claim 2; and

5

(iii) removing the protecting group Q, if present, to yield a compound of formula (I).

5. A compound of the formula (III)



wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single
10 or double bond,

m is 0 or 1,

R₁ represents a C₁-C₁₂alkyl, C₃-C₈cycloalkyl or C₂-C₁₂alkenyl, group,

15 R₈ represents C₁-C₆alkyl that is optionally substituted with one to five substituents selected from the group consisting of halogen, C₁-C₆alkoxy, hydroxy, cyano, aryl, benzyl or heteroaryl, which, depending on the possibilities of substitution on the ring, are mono- to trisubstituted by substituents selected from the group consisting of OH, halogen, CN, NO₂, C₁-C₁₂alkyl, C₁-C₁₂haloalkyl, C₁-C₁₂alkoxy, C₁-C₁₂haloalkoxy, C₁-C₁₂alkylthio and C₁-C₁₂haloalkylthio, and

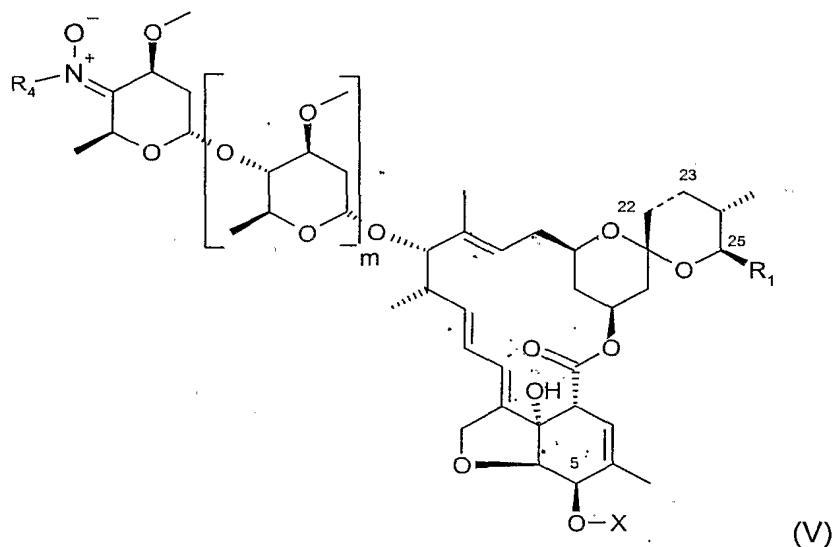
-171-

X represents H or Q, where Q is a suitable protecting group to prevent reaction on the oxygen atom at the 5-carbon position;

or, if appropriate, an E/Z isomer and/or diastereoisomer and/or tautomer of the compound of formula (III), in each case in free form or in salt form.

5

6. A compound of the formula (V)



wherein the bond between carbon atoms 22 and 23 indicated with a broken line is a single or double bond,

10 m is 0 or 1,

R₁ represents a C₁-C₁₂alkyl, C₃-C₈cycloalkyl or C₂-C₁₂alkenyl, group,

R₄ represents a chemical constituent, and

X represents H or Q, where Q is a suitable protecting group to prevent reaction on the oxygen atom at the 5-carbon position; or, if appropriate, an E/Z isomer and/or

15 diastereoisomer and/or tautomer of the compound of formula (V), in each case in free form or in salt form.

-172-

7. A pesticidal composition comprising at least one compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively, as active compound, and at least one auxiliary.
- 5 8. A method for controlling pests comprising applying a composition defined claim 7 to the pests or their habitat.
9. A process for preparing a composition defined in claim 7 comprising mixing intimately and/ or grinding at least one compound least one compound of the formula (I), (III) or (V),
10 as defined in claim 1, 5 or 6 respectively, as active compound, with at least one auxiliary.
10. The use of a compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively, for preparing a composition as defined in claim 7.
- 15 11. The use of a composition as defined in claim 7 for controlling pests.
12. A method for protecting plant propagation material comprising treating the propagation material, or the location where the propagation material is planted, with a composition defined in claim 7.
- 20 13. A pest resistant plant propagation material having adhered thereto at least one compound of the formula (I), (III) or (V), as defined in claim 1, 5 or 6 respectively; preferably treated by the method of claim 12.
- 25 14. The use of compound defined in claim 5 or 6 for preparing a compound of formula (I) as defined in claim 1.